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ENGINEERING EVALUATION / FACT SHEET

BACKGROUND INFORMATION

Application No.:	R13-0462A
Plant ID No.:	009-00018
Applicant:	Petroleum Fuel & Terminal Company
Facility Name:	Weirton Terminal
Location:	Half-Moon Park, Weirton
NAISC Code:	424710
Application Type:	Modification
Received Date:	January 20, 2012
Engineer Assigned:	Edward Andrews
Fee Amount:	$4,500.00
Date Received:	January 25, 2012
Completeness Date:	April 12, 2012
Due Date:	July 11, 2012
Newspaper:	*The Weirton Daily Times*
Applicant Ad Date:	January 18, 2012
UTMs:	Easting: 531.6 km Northing: 4,471.0 km Zone: 17T
Description:	This modification is to allow the facility to receive, store, and load crude oil, natural gas condensate, and vacuum gas oil at the Weirton Terminal.

DESCRIPTION OF PROCESS

Petroleum Fuel & Terminal Company (PF&TC) is planning to expand the operations of its Weirton, West Virginia facility. A change in the emission activities of the facility will result in this change. The business operation of PF&TC's Weirton Terminal is identified by the Standard Industrial Classification (SIC) code 5171 (Petroleum Bulk Station & Terminals)

The Weirton Terminal manages vacuum gas oil (VGO). VGO is classified as a heavy petroleum distillate. VGO can be used as feed to catalytic conversion units which can convert the VGO to high value transportation fuels. Through blending and the use of cetane improvers, this fraction produces high quality auto-gas oil. Also, its density and cetane properties make the blend ideal for producing industrial gasoil when winter demand is high. This petroleum product is received via a river barge dock. The barge dock includes two barge berths for unloading and loading of commodities. The off-loaded commodities is directed via pipeline to one of five existing bulk storage tanks.

Load-out operations is performed at the barge dock. Up to two barges can be loaded at any one time with a maximum rate of 5,000 barrels per hour. Currently, no air pollution control device is operated at the barge dock. The facility operates fuel combustion units to heat piping and storage tanks involved in the transfer and storage of VGO or other commodities on an as needed basis. The following table identifies the fuel combustion units.

Table #1 - Fuel Combustion Units

Combustion Unit	Maximum Design Heat Input (MMBtu/hr)	Unit Identification	Fuel Type
Hot Oil Heater	8.4	Heater 1	Natural Gas
Hot Oil Heater	8.4	Heater 2	Natural Gas
Steam Boiler	25.1	Boiler 1	Fuel Oil

A small 12,000 gallon tank is used to store fuel oil for the boiler. There are three truck loading racks at the facility which are out of service.

PF&TC is proposing to manage crude oil and natural gas condensate (NGC) at the Weirton Terminal. The facility has the potential to manage up to 30,000,000 barrels per year of crude oil and/or NGC. The five existing storage tanks (Tanks 225-1, 150-2, 150-3, 100-4, and 54-5) are to be retrofitted with internal floating roofs. Crude oil and natural gas condensate off-loaded from river barges would be directed to one of the storage tanks. Load-out operations at the barge dock is to include crude oil and NGC. Vapor from the load-out of crude oil and NGC are to be collected by a marine vapor collection system (MVCS) and directed to a vapor combustion unit (flare). Presented in the following table is a breakdown of the storage capacity by the individual tank.

Table #2 – Tanks at the Terminal

Tanks Name/ID No.	Date of Construction	Capacity (gallons)	Capacity (barrels)
Tank 225-1	1978	9,260,000	220,471
Tank 150-2	1978	6,227,000	148,262
Tank 150-3	1978	6,227,000	148,262
Tank 100-4	1978	3,926,000	93,476
Tan54-5	1978	2,142,000	51,000
Total Capacity		27,782,000	661,471

Basically, the Weirton Terminal will be operated in a similar manner as it is currently being operated with the expectation that commodities such as crude oil and NGC can be managed at the terminal with emission from such operations be controlled.

SITE INSPECTION

Since the Weirton Terminal was constructed in 1978, the agency has conducted several inspections over the years of this facility. The facility has either been determined to be in compliance in the past 8 inspections. The most recent of these inspections took place on February 18, 2010, and was conducted by Mr. Steven Sobutka, P.E. of the Northern Panhandle Regional Office. Mr. Sobutka conducted a "Full On Site" inspection of the terminal and determined it to be operating within compliance of all applicable state and federal rules and regulations. Therefore, the writer determined that no site inspection of this facility is necessary for this permitting action.

ESTIMATE OF EMISSIONS BY REVIEWING ENGINEER

The applicant estimated emissions from nearly every stationary source located at the facility within the application. In this section, the writer focused on the emission sources that are being changed or affected by the proposed changes.

Volatile Organic Liquid Storage

Emissions generated or potentially released due to this proposed modification are from breathing losses and working loses of volatile organic compounds. In the recent past, PF&TC has been storing vacuum gas oil (VGO), which is claimed to be similar to #6 Fuel Oil, in Tanks 225-1, 150-2, 150-3. In 1984, PF&TC obtained permission to handle gasoline under Permit R13-0751. However, the facility had issues with other third party transportation haulers meeting the vapor tightness requirements of Subpart XX of 40 CFR 60 and was never able to demonstrate compliance with Subpart XX. Therefore, gasoline was never handled at the terminal.

When the facility was originally constructed, the main purpose of the terminal was to off-load marine barge of fuel oil grades #2 to #6 for Weirton Steel Corporation's Weirton Mill, which is covered under Permit R13-462. The main changes outlined in the permitting action from the original facility is that the facility will handle two new liquids, which are crude oil and natural gas condensate, and load out back to barges instead of tanker trucks.

PF&TC used U.S. EPA Tanks 4.09d to estimate VOC emissions generated from storing crude oil, natural gas condensate (NGC) and vacuum gas oil (VGO) from the existing tanks with internal floating roofs installed in them. This writer repeated these estimates for the storage tanks using the latest version of the Tanks program. The applicant had limited data on NGC and input this data into Tanks using the partial speciation option. The writer was able to verify the applicant's result. A second run was conducted by assuming the NGC behaves as gasoline with

a Reid Vapor Pressure (RVP) of 9. Some agencies are requiring sources storing NGC to estimate emissions based on this assumption. The results of these different runs demonstrates that the applicant's approach is more conservative than treating NGC as gasoline RVP 9. Looking at the break down of results for each of the tanks for crude oil and NGC, one can see that the tank dimensions and turnovers (annual throughput) is very significant.

Table #3 – Emissions from Storing Crude, NGC, & VGO				
Tanks Name/ID No.	Crude Oil (TPY)	NGC (TPY)		VGO (TPY)
Tank 225-1	1.3	6.95	4.19*	0.2
Tank 150-2	2.09	4.09	2.55*	
Tank 150-3	2.09	4.09	2.55*	
Tank 100-4	1.11	3.45	1.98*	
Tan54-5	0.60	2.49	1.49*	
Total Emissions	7.19	21.07	12.76*	0.2
Total Throughput (bbl)	35,183,130	40,466,410		5,183,280

* – Treated the natural gas condensate as gasoline with a Reid Vapor Pressure of 9 psia.

Tank 225-1 is the largest tank at the terminal. The VOCs emissions for this tank are misleading between the commodities. The throughput for NGC double compared to crude oil. The rest of the tanks' predicted runs were conducted with the same throughput of crude oil as NGC.

Load-out Operations

Emissions due to off-loading products from barges are counted as working losses from the storage, which is calculated in the TANKS run and included in the above estimates. Loading operations generate VOC losses or emissions when the barges are loaded from the marine loading dock. PF&TC is proposing to load the same products into barges. PF&TC is proposing the quantities for the various products as shown in the following table with the corresponding emissions.

Table #4 – Load-out Emissions by Product					
Product	Proposed Throughout	Uncontrolled VOC Emission		Controlled VOC Emission	
	bbl.	TPY		TPY	
Crude Oil	30,000,000	661.5	745.3*	52.6	51.4
NGC	30,000,000	3125		52.6	
VGO	494,595	6.2		6.2	

* – Recalculated using a vapor pressure of 5 psia.

The methods that were used to estimate the uncontrolled VOC emissions in the above table are outlined in AP-42, Chapter 5.2 (July 2008). The writer verified the application's emission estimates associated with the loading of barges at the Marine Loading Dock. Assumptions that were made by the applicant were that unclean barges were being loaded.

The controlled VOC emission estimates by the applicant were based on guarantees provided by the vapor control unit manufacturer, which is 10 mg per liter of product loaded (8.36 e^{-5}lb of VOC per gal of liquid loaded). The writer used a different approach and assumed a collection efficiency of 95% (assumed 5% for leaks/loses) with a destruction efficiency of 98% for the flare. There is an 80 ton difference of uncontrolled VOC emissions due to changes in the vapor pressure of the crude oil. However, this difference is nearly erased when comparing the controlled emissions from loading crude oil, which is a little over 1.2 tons per year difference. Actual VOC emissions would be 44 tons for crude oil assuming the flare meets the manufacturer's minimum design destruction efficiency of 99%.

The operation of the flare would generate other pollutants such as particulate matter (PM), carbon monoxide (CO), and oxides of nitrogen (NO_x). The applicant only estimated CO and NO_x emissions that would be created from combusting natural gas from the pilot light. PM, CO, and NO_x emissions are generated from the combustion of the waste effluent. Thus, the writer estimated the flare's maximum hourly emissions rate of CO and NO_x to be 8.7 lb per hr. and 14.5 lb per hr respectively. To accommodate the loading of 30 million bbl of either crude oil or NGC, the flare would have to be operated at least 6,000 hours per year, which is operating the loading rate at a maximum fill rate of 5,000 bbl per hour (bph). The annual CO and NO_x potential would be 38.1 tpy and 63.5 tpy respectively. Using a PM emission factor from Chapter 1.4-2 of AP-42, the writer estimated that the $PM/PM_{10}/PM_{2.5}$ emissions to be 0.44 pounds per hour and 1.3tons per year, which includes the filterable and condensable portions.

Equipment Leaks

VOC emissions from fugitive sources such as potential equipment leaks were estimated using the methods and emission factors in API Publication # 4588 (Development of Fugitive Emission Factors and Emission Profiles for Petroleum Marketing). Fugitive emissions for the following equipment components are provided below:

Table #5 – Equipment Leaks

Component	No. of Components	Emission Factor (lb/component –hr)	VOC Emission Rate (TPY)
Loading Arms	4	0.00087	0.015
Meters	8	0.00025	0.009
Pump Seals	8	0.00093	0.035
Valves	50	0.00015	0.033
Total	70	-	0.092

Facility Wide Total PTE

The following table presents the facility's potential to emit (PTE) by emission unit for each pollutant.

Table #6 – Facility PTE						
Emission Unit/Activity	Pollutants					
	VOCs	CO	NO_x	SO_2	$PM/PM_{10}/PM_{2.5}$	HAPs
VOL Storage	21.1					2.71
Marine Load Rack	10.4					
Fuel Combustion Units	0.42	6.51	8.68	9.42	0.69	
Oil/Water Separator	1.0					
Flare	52.6	38.1	63.5		1.3	6.66
Equipment Leaks	0.01					
	85.53	44.61	72.18	9.42	1.3	9.37

REGULATORY APPLICABILITY

WV STATE RULES

45CSR2 To Prevent and Control Particulate Air Pollution From Combustion of Fuel In Indirect Heat Exchangers

&

45CSR10 To Prevent and Control Air Pollution From Emissions of Sulfur Oxides

These two rules establish emission limitations for smoke and particulate matter (Rule 2), and sulfur dioxide (Rule 10), which are discharged from fuel burning units. The existing units at the facility are two 8.4 MMBtu/hr natural gas fired hot oil heaters and one 25 MMBtu/hr fuel oil fired steam boiler. The agency recognizes that natural gas is a clean burning fuel and assumes "Type b" fuel burning units to be capable of complying with PM and visible emission limitations of Rule 2 and the sulfur dioxide limit of Rule 10. In addition, 45CSR§2-11.1 and 45CSR§10-10.1 exempts the two heaters from most of the applicable requirements of these two rules except for the visible emission standard of 45CSR§2-3.1. The agency recognizes burning of natural gas in process heaters and boilers should not generate visible emissions and deemed it unnecessary to develop a monitoring plan to verify compliance with the visible emission standard.

The steam boiler is greater than 10 MMBtu/hr and is subject to the following:

- 10% Opacity Standard [45CSR§2-3.1]
- Particulate Matter Standard of 0.09 lb of PM per MMBtu/hr (equates to 2.26 lb/hr) [45CSR§2-4.1.b.]
- Sulfur dioxide standard of 3.1 lb of SO_2 per MMBtu/hr (equates to 77.81 lb/hr)[45CSR§10-3.1e.]
- Record the date& time of each start-up and shutdown; the quantity of fuel consumed on a monthly basis; and heating value of the fuel received. [45CSR§2-8.3.c., 45CSR§2A-7.1.a.2.]

The boiler is fired with #2 Fuel Oil, which is classified as distillate oil, and has a potential of 27.2 lb of SO_2 per hour. Thus, the boiler is exempt from the recordkeeping requirements of Section 8 of Rule 10 in accordance with 45CSR§10-10.3. Burning #2 Fuel Oil, this unit has the potential to emit of 0.13 lb of PM per hour. This unit is capable of meeting the emission standards from both of these rules without the use of any additional controls.

45CSR13 - Permits for Construction, Modification, Relocation and Operation of Stationary sources of Air Pollutants, Notification Requirements, Administrative Updates, Temporary Permits, General Permits, and Procedures for Evaluation

The increase in the potential to emit from the Weirton Terminal as a result of this proposed change will be greater than 6 pounds per hour and 10 tons per year of VOCs, which is the trigger level of a modification of a source as defined in 45CSR§13-2.24. Thus, the facility must obtain a permit as required in 45CSR-13.5.1.

The facility has met the applicable requirements of this rule by publishing a Class I Legal Advertisement in the *Weirton Daily Times* on January 18, 2012, paid the $1000.00 application fee, paid the $1000.00 New Source Performance Standard (NSPS) fee, paid the $2,500.00 Maximum Available Control Technology (MACT) fee, and submitted a complete permit application.

The facility is classified as a minor source (i.e. has PTE of < 100 TPY of PM and VOCs; <25 TPY of HAPs) concerning applicability under Title V (45CSR30). At one time, the storage tanks and tanker truck loading ranks were subject to NSPS Subparts Ka and XX. Due to issues beyond PF&TC control, the Weirton Terminal never handled gasoline and remained as a Rule 22 source.

By managing crude oil and NGC other regulations apply to the terminal. Under 45 CSR 30, these regulations (NSPS Subpart Kb) bring the terminal into this federal operating permit program. However, PF&TC elected to install controls and take limitations that limit the facility potential emissions below major source trigger levels as defined in 45 CSR 30. Thus, PF&TC is not required to obtain a Title V Operating Permit but has to submit an annual Certified Emission Statement and fees as stated in 45 CSR30 at a minimum as a "6D" source as a result of this permitting action.

Since PF&TC has proposed a controls and loading limitations to avoid major source permitting requirements and operating a Title V Operating Permit, the applicant must publish a commercial ad and post a sign in accordance with 45CSR§§13-8.5., 8.5.a., and 8.4.a. to meet the requirements of Notice Level C in Rule 13.

45CSR14 Permits for Construction and Major Modification of Major Stationary Sources of Air Pollution for the Prevention of Significant Deterioration

The Weirton Terminal before this project is classified as a minor source and thus is not subject to this rule as a major source. First, it must be determined which major source definition applies to this facility (45 CSR §14-2.43a. and 45 CSR §14-2.43.g.). The terminal has the capacity to store over 660,000 barrels of petroleum products, which meets the criteria of a "Petroleum Storage and Transfer Unit with a Total Storage Capacity Exceeding 300,000 Barrels" as identified in §14-2.43a. Thus, the terminal would be a major source if it has the potential to emit 100 tpy of any regulated NSR pollutant (45CSR§14-2.43a.).

Before controls, the terminal has the potential to emit over 3,100 tpy of VOCs, which is a NSR Pollutant. With the application of the IFR on the storage tanks and the MVCU for loading crude oil and NGC with an annual throughput of 30,000,000 barrels, the VOC potential from the terminal is reduce to less than 90 tpy, which is below the major source trigger level of 100 tpy. Thus, this project is not subject to the permitting requirements of this rule.

However, the applicant will be required to perform the requirements of "Notice Level C" under 45 CSR §13-8.5. The applicant will be required to publish a commercial display advertisement as set forth in §13-8.4a. and post a sign as stated in §13-8.5.a. As result of this permitting action, the facility is considered as a synthetic minor for

40 CFR 60 Subpart Kb Standard of Performance for Volatile Organic Liquid Storage Vessels for Which Construction, Reconstruction, or Modification Commenced After July 23, 1984.

PF&TC has been managing fuel oils (# 2 through #6 and VGO in the five storage tanks. Subparts K and Ka defines that these products are not petroleum liquid. Thus, these tanks have not been subject to these subparts.

However, PF&TC has proposed to store crude oil and NGC in these tanks. These products are classified as petroleum liquids under these two subparts. Storing these products would result in a emission increase greater than a kg per hour, which is the definition of a modification in §60.14(a). The writer evaluated the emission increase of Tank 225-1 from storing VGO to crude oil without taking into account the internal floating roof, which yielded a VOC emission increase of just less than 6 kg/hr. With the internal floating roof, there is an actual decrease in VOC potential even with storing crude oil.

EPA noted in a Determination No. 0400015 that a simple change in the type of material stored in a vessel or adding a floating roof by itself is not a modification under the NSPS.

However, these tanks at the Weirton Terminal were not originally subject to either Subpart K or Ka because of the type of liquid being stored. Since crude oil and NGC are classified petroleum liquids under these subparts, and this change is occurring after July 23, 1984, then Subpart Kb applies.

Each tank has a storage capacity greater than 40,000 gallons. Based on the above factors the tanks will be subject to the following requirements of Subpart Kb which will be incorporated into the draft permit:

§60.112b(a)(1)(A) Standards for VOC
§§60.113b(a)(1), (2), (4), (5) Testing Procedures (inspection criteria)
§60.115b(a) Reporting and Record Keeping Requirements; and
§60.116b Monitoring Requirements.

40 CFR Subpart 61 BB (Benzene Transfer Operations), 40 CFR 63 Subpart R (Gasoline Distribution) and 40 CFR 63 Subpart BBBBBB (Gasoline Distribution Bulk Terminals, Bulk Plants, and Pipeline Facilities)

Subpart BB applies to loading racks that includes the loading of benzene into marine vessels, which includes inland barges. However, the subpart specifically exempts loading racks in which only the following products are loaded: benzene-laden waste, gasoline, crude oil, natural gas liquids, petroleum distillates, or benzene-laden liquid from coke by-product recovery plants. The terminal has the potential to load only exempted liquids, and is not subject to the requirements of Subpart BB.

The terminal is not a major source of hazardous air pollutants and is not subject to Subpart R.

In Subpart BBBBBB, EPA uses the same definition of gasoline as noted in the RACT Applicability portion of 40 CFR 63, Subpart Y. In addition, the same definition of gasoline is used in 40 CFR 60, Subpart XX (Standard of Performance for Bulk Gasoline Terminals). The Weirton Terminal does not manage gasoline and is not subject to 40 CFR 63 Subpart BBBBBB or 40 CFR 60 Subpart XX.

40 CFR 63 National Emission Standards for Marine Tank Vessel Loading Operations Subpart Y

Maximum Achievable Control Technology (MACT) Applicability:

The MACT standards of §§63.562(b) and (d) are applicable to existing and new sources with a potential to emit hazardous air pollutants at or greater than 10 tons per year of single HAP or 25 tpy total HAPs. Basically, the MACT control requirements apply to major sources of HAPs as defined in Part 63. There are some exemptions as listed in 40 CFR 63.560(d). §63.560(d)(1) exempt emissions from the applicability tests that result from loading products with a vapor pressure of less than 1.5 psia. For this facility, the emissions generated from

loading VGO and the fuel oils (#2 through #6) are exempted from the MACT applicability test of this subpart.

The Weirton Terminal is considered an existing source and has emissions of less than 10 tpy of a single HAP and 25 tpy of total HAPs; and is subject to the following requirements of 40 CFR §63.560(a):

> **§63.560(a)(2)** which indicate that existing sources with emissions less than 10 and 25 tpy of HAPs are not subject to the emission standards in §§63.562(b) and (d). Requirements in (b) are for major sources and (d) applies specifically to the Valdez Marine Terminal (VMT) in Alaska;
>
> **§63.560(a)(3)** which requires existing sources with emissions less than 10 and 25 tpy of HAPs to comply with the recordkeeping requirements of §63.567.(j)(4) and the emission estimation requirements of §63.565(l); and
>
> **§63.560(a)(4)** which indicate that existing sources with emission less than major source trigger levels must comply the submerged fill standards of 40 CFR §153.282. §153/282 defines the maximum height of the discharge point above the bottom in the marine vessel, whichever is the greater 4 inches or radius of the fill line.

These provisions will be incorporated into the draft permit.

Reasonably Available Control Technology (RACT) Applicability:

This regulation has a RACT standard within it. These provisions apply to sources with an annual loading throughput of at least or greater than 10 million (M) barrels of gasoline or 200 M barrels of crude oil. The maximum possible loading rate at the Weirton Terminal is 43.8 M barrels (maximum hourly rate of 5,000 barrels per hour for the marine loading dock).

The terminal has the potential to manage crude oil and natural gas condensate (NGC). With regards to crude oil, the terminal cannot physically reach or exceed the 200 M barrel trigger level. However, NGC has some characteristics that are similar to gasoline. EPA defined gasoline in Subpart Y, as any petroleum distillate or petroleum distillate/alcohol blend having a Reid vapor pressure of 4.0 psia or greater and is used as a fuel for internal combustion engines.

According to the MSDS for NGC, it is a complex combustion of hydrocarbons (predominantly C2 through C8) separated and/or condensed from natural gas during transportation, wellhead collection, and/or from the production, gathering transmission and distribution pipelines in drips, scrubbers, etc. The condensate does contain hydrocarbons that are within the boiling range of gasoline. Typically, this product must be processed before it can be used as a desirable product or even be combusted in a internal combustion engine. Thus, the writer concurs with the applicants conclusion that NGC is not gasoline as defined in this regulation and that the Weirton Terminal is not subject to the RACT requirements of §63.562(c).

40 CFR 63 National Emission Standards for Hazardous Air Pollutants for Area Sources: Industrial, Commercial, and Institutional Boilers Subpart JJJJJJ

This regulation establishes emission limitations for area sources (minor sources of HAPs) that operate at least one boiler. The Weirton Terminal is a minor source of HAPs and has one steam boiler on site. Thus, the facility is subject to this regulation.

The hot oil heaters are not classified as a boiler under 40 CFR §60.11237. Thus, these heaters are not affected sources under this regulation. However, Steam Boiler #1 burns liquid fuel (fuel oil) and therefore is an existing affected source under this regulation.

Steam Boiler #1 has a maximum heat input of 25 MMBtu/hr and therefore is only subject to the work practices of §63.11223, which requires biennial boiler tune-ups. Because the heat input of Steam Boiler #1 is greater than 10 MMBtu/hr, the facility is subject to the energy assessment requirements of §63.11214(c). Currently, EPA has issued a "No Action Assurance" letter and proposed a reconsideration rule to replace the current regulation. The letter only delays the compliance deadline for conducting the initial boiler tune-ups to October 1, 2012. The draft permit will include the boiler tune-up, energy assessment and notification requirements of the current regulation with the extension for the tune-up granted under the "No Action Assurance" Letter.

TOXICITY OF NON-CRITERIA REGULATED POLLUTANTS

The applicant identified the following hazardous air pollutants which are in crude oil and natural gas condensate: benzene, toluene, ethyl benzene, mixed xylenes, and n-hexane. Thus, the following hazardous air pollutants will be emitted from the storing and loading of cruder oil and natural gas condensate at the Weirton Terminal(all information comes directly from EPA's Air Toxic Website):.

Benzene

Benzene is found in the air from emissions from burning coal and oil, gasoline service stations, and motor vehicle exhaust. Acute (short-term) inhalation exposure of humans to benzene may cause drowsiness, dizziness, headaches, as well as eye, skin, and respiratory tract irritation, and, at high levels, unconsciousness. Chronic (long-term) inhalation exposure has caused various disorders in the blood, including reduced numbers of red blood cells and aplastic anemia, in occupational settings. Reproductive effects have been reported for women exposed by inhalation to high levels, and adverse effects on the developing fetus have been observed in animal tests. Increased incidence of leukemia (cancer of the tissues that form white blood cells) have been observed in humans occupationally exposed to benzene. EPA has classified benzene as known human carcinogen for all routes of exposure.

Ethyl benzene

Ethyl benzene is mainly used in the manufacture of styrene. Acute (short-term) exposure to ethyl benzene in humans results in respiratory effects, such as throat irritation and chest constriction, irritation of the eyes, and neurological effects such as dizziness. Chronic (long-term) exposure to ethyl benzene by inhalation in humans has shown conflicting results regarding its effects on the blood. Animal studies have reported effects on the blood, liver, and kidneys from chronic inhalation exposure to ethyl benzene. Limited information is available on the carcinogenic effects of ethyl benzene in humans. In a study by the National Toxicology Program (NTP), exposure to ethyl benzene by inhalation resulted in an increased incidence of kidney and testicular tumors in rats, and lung and liver tumors in mice. EPA has classified ethyl benzene as a Group D, not classifiable as to human carcinogenicity.

Toluene

Toluene is added to gasoline, used to produce benzene, and used as a solvent. Exposed to toluene may occur from breathing ambient or indoor air. The central nervous system (CNS) is the primary target organ for toluene toxicity in both humans and animals for acute (short-term) and chronic (long-term) exposures. CNS dysfunction and narcosis have been frequently observed in humans acutely exposed to toluene by inhalation; symptoms include fatigue, sleepiness, headaches, and nausea. CNS depression has been reported to occur in chronic abusers exposed to high levels of toluene. Chronic inhalation exposure of humans to toluene also causes irritation of the upper respiratory tract and eyes, sore throat, dizziness, and headache. Human studies have reported developmental effects, such as CNS dysfunction, attention deficits, and minor craniofacial and limb anomalies, in the children of pregnant women exposed to toluene or mixed solvents by inhalation. Reproductive effects, including an association between exposure to toluene and an increased incidence of spontaneous abortions, have also been noted. However, these studies are not conclusive due to many confounding variables. EPA has classified toluene as a Group D, not classifiable as to human carcinogenicity.

Mixed Xylene

Commercial or mixed xylene usually contains about 40-65% m-xylene and up to 20% each of o-xylene and p-xylene and ethyl benzene. Xylenes are released into the atmosphere as fugitive emissions from industrial sources, from auto exhaust, and through volatilization from their use as solvents. Acute (short-term) inhalation exposure to mixed xylenes in humans results in irritation of the eyes, nose, and throat, gastrointestinal effects, eye irritation, and neurological effects. Chronic (long-term) inhalation exposure of humans to mixed xylenes results primarily in central nervous system (CNS) effects, such as headache, dizziness, fatigue, tremors, and incoordination; respiratory, cardiovascular, and kidney effects have also been reported. EPA has classified mixed xylenes as a Group D, not classifiable as to human carcinogenicity.

Hexane

Hexane is used to extract edible oils from seeds and vegetables, as a special-use solvent, and as a cleaning agent. Acute (short-term) inhalation exposure of humans to high levels of hexane causes mild central nervous system (CNS) effects, including dizziness, giddiness, slight nausea, and headache. Chronic (long-term) exposure to hexane in air is associated with polyneuropathy in humans, with numbness in the extremities, muscular weakness, blurred vision, headache, and fatigue observed. Neurotoxic effects have also been exhibited in rats. No

information is available on the carcinogenic effects of hexane in humans or animals. EPA has classified hexane as a Group D, not classifiable as to human carcinogenicity.

AIR QUALITY IMPACTS ANALYSIS

The writer deemed that an air dispersion modeling study or analysis was not necessary, because the proposed facility does not meet the definition of a major source as defined in 45CSR14.

MONITORING OF OPERATIONS

Monitoring the facility is mostly focused around tracking the filling of tanks and barges by specific product. The application originally proposed limiting the facility's crude oil and NGC throughput to 30 M barrels per year. After submittal, PF&TC proposed installing a floating roof on Tank 225-1, which is the largest tank at the facility. This allows PF&TC to store crude oil and NGC in any of the tanks at the terminal. In this revised application, Tank 225-1 would have a throughput of 5.1 M barrels of crude oil and 10.3 M of NGC. The management of NGC in the storage tanks yields the most VOCs emissions. To simply the specific throughput within the permit, Condition 4.1.1. establishes a total throughput of crude oil and NGC of 40.3 M barrels. However, the applicant needs to track the throughput by specific product for emission inventory purposes. Brooke County has had a history of air quality related issues over the years. Thus, it is important to have emission inventories based on good emissions data.

The main point of this permitting action is to create a federally enforceable document that limits the facility potential to emit of VOCs below the PSD and Title V 100 tpy trigger levels. Thus, the applicant will be required to demonstrate that the proposed VCU (enclosed ground, air-assisted flare) is meeting the minimum destruction efficiency of 98% for VOCs. EPA developed specific criteria for flares in demonstrating this minimum efficiency rating, which evolves heat content and velocity of the effluent, and lack of visible emissions.

Therefore, the draft permit adopts the appropriate provisions of 40 CFR §60.18 for air assisted flares. EPA has concluded that if a flare meets the requirements of §60.18, then the flare is operating with a minimum destruction efficiency of 98%. In addition, the writer requires the tracking of the oxygen content measured by the oxygen analyzer during this demonstration. The proposed MVCS is equipped with a dual oxygen analyzer used to determine the amount of enrichment gas (natural gas) needed for good combustion of the effluent.

CHANGES TO Permit R13-0462

Permit R13-462 was issued on December 21, 1978 under the standard typical one page permit format used during that time. Thus, there are no specific or special conditions to the

emission units covered by this permit. The draft permit will include the applicable requirements as noted in the REGULATORY APPLICABILITY Section of this evaluation.

The Weirton Terminal is located in Brooke County, which currently meets the current National Ambient Air Quality Standards for sulfur dioxide. However, Brooke has already been identified that the area will not be able to meet the new National Ambient Air Quality Standards for sulfur dioxide once it becomes effective. The allowable for sulfur dioxide emissions from Steam Boiler #1 would be 78 pounds per hour which equates to an annual rate of 341 tpy of SO_2. PF&TC proposed a fuel oil usage limit of 132,139 gallons per year. With a maximum of 1 percent sulfur in the fuel oil, this proposed limit would restrict the potential discharge of sulfur dioxide for the boiler below ten tons per year. Thus, the permit will have this fuel oil usage limit and sulfur dioxide limits (hourly and annual).

The same case applies to $PM_{2.5}$ for boiler as well. The Rule 2 allowable is unrealistically high for this unit located in an area that has been classified as non-attainment for $PM_{2.5}$. Thus, a $PM/PM_{10}/PM_{2.5}$ limit is established based on the potential to emit of the boiler rather than the allowable under Rule 2.

RECOMMENDATION TO DIRECTOR

The information provided in the permit application indicates that compliance with all applicable regulations should be achieved. Therefore, the writer recommends that the Director grant a modification permit to Petroleum Fuel & Terminal Company to manage crude oil and natural gas condensate with a combined throughput rate of 30 M barrels per year at the Weirton Terminal.

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Engineer

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